

Translation Of
"Cleaning Cloth with Detergent Deposit"German Patent #25 49,065 P120Application Date: Nov. 3, 1975Issue Date: May 5, 1977Applicant: Vereinigte Papierwerke Schickedanz & Co., 8500 NuernbergInventors: Helmut Pietsch and Walter Horn and Gernot Nunner

The discovery concerns a cleaning cloth with a detergent deposit, which is to be used especially as a household cleaning cloth, but which also is suitable for cleaning windshields for motor vehicles, for office cleaning as well as likewise even for the care of machines and equipment in industrial operations.

From German petty patent #1, 884, 410 is already known a window cleaning cloth, which consists of an absorptive web, which is completely saturated with an emulsion of a nonionic soap, a dressing and a carrier. For example, the sodium salt of a fatty alcohol ether sulfate is suggested as the nonionic soap and methyl cellulose slime is suggested as the carrier. In cleaning cloths of this known type, the difficulty exists to provide a sufficient amount of deposit of the wash-active substance, since the water soluble fixing agent is not in the position to retain the substance on the cloth matrix for a long time when sufficient water is offered.

A sponge filled with soap, in which the difficulty mentioned of sufficiently long deposit action is avoided by the fact that a compact piece of soap is arranged on the inside of the sponge which naturally holds out with normal usage just as well as that which is known for a piece of soap, is known from German Patent #24. 44 374. However, products of this type cannot be made in towel form, so that they are indeed capable of being inserted for purposes of cleaning the body, but not for cleaning structures, window polishes and the other areas of application mentioned at the outset.

With this state of the technology, the task exists to give a cleaning cloth with a detergent deposit, whose deposit action is strongly increased compared with the towels known till now and which also withstands numerous phases of usage without exhaustion of the deposit even with an abundant offering of water.

This task is resolved according to the discovery by the fact that the towel has one or several layers of deposit, in which the wash active substance is fixed by means of water-insoluble organic binders, and that at least the flat sides of the layer of deposit are covered with porous top layers. The layer of deposit can advantageously consist of fleece or of open-celled soft sponge material. Wax or one of the wax substitutes known, such as higher saturated hydrocarbons, paraffin, stearin or synthetic waxes, can be advantageously inserted for fixing the wash active substance in this layer; however, it is also possible to use organic lacquer-like substances or

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finally powdered thermoplastics, by whose help the wash active substance can be tightly sintered into the layer of deposit. The top layer of the cleaning towel advantageously consists of fleece, also a textile fiber fleece connected by means of plastics, and it is glued to the layer of deposit.

The manufacture of such cleaning towels with a detergent deposit can be undertaken in that a web of fleece or open-celled soft sponge material is first soaked with an aqueous solution of a wash active substance and is dried. The product thus obtained is then soaked with the solution of an organic water insoluble binder, the web thus obtained is covered with at least one top layer, doubled, if necessary, dried again and cut into individual towels.

In another variation of the manufacturing process, it can happen that a web of fleece or open-celled soft sponge material is loaded at first with a pasty mixture of wash active substance and the solution of water insoluble organic binder, is then covered with a porous top layer at least on one side, doubled if necessary, dried and cut into individual towels. In both developments of the procedure, the water insoluble organic binder, thus, for example, wax, a laquer substance or the like simultaneously serves as a means of fixing the wash active substance and also as a means for gluing the top layer-fleece. If the deposit layer should be made thicker in a simple manner and moreover, the introduction of two top layer-webs should be avoided, then, as suggested, the deposit layer can be put on the one side on the deposit material which is still wet with the binder and this can then be doubled, whereby the binder also serves for holding together the doubled deposit layer in addition to fixing the wash active substance.

However, the cleaning towels suggested can also be made so that a web of fleece or open-celled soft sponge material is first loaded with a powdered mixture of wash active substance and a thermoplastic material, the web is heated briefly to the sintering temperature of the thermoplastic material and is lined at least on the one side with a top layer, is doubled if necessary and is cut into individual towels. In this case a powdered organic material, which is not dissolved in a solvent, but is one in which the binding action is produced by the fact that the product is briefly heated to sintering temperature, serves as the binder. Since the web is again cooled off in this case immediately after the occurrence of the sintering process, it is obviously necessary to use lining technology for introducing the top layer, even to glue the top layer to the surface by means of an adhesive which is known in itself. The cleaning towels suggested are more closely explained in the following by means of the attached diagram.

Figure 1 represents a schematic cross section through a cleaning towel coated on both sides.

Figure 2 represents a schematic cross section through a doubled cleaning towel.

In the example of execution represented in Figure 1, the deposit layer 1 is carried out in one layer. It consists of a fleece of sufficient weight, for example, a commercial staple fleece fiber of 22 g/m^2 surface weight. The deposit layer is loaded with a wash active substance 2 and this adheres to the deposit layer by means of a water insoluble organic binder.

Deposit layer 1 is always covered on the upper- and lower side with top layer 3, whereby the top layer 3 is held to the deposit layer by means of a separate adhesive or by means of the water insoluble substance inserted as the binder in each case according to the type of manufacturing.

In the example of execution represented in Figure 2, the deposit layer 1 is doubled, thus placed in two layers on top of one another, which can occur the simplest by folding. The form of execution represented there is made so that a simple deposit layer 1 is produced at first and this is loaded with wash active substance in the manner already described and is thereupon covered unilaterally with top layer 3. After that, the entire laminate is doubled over, whereby the folding is undertaken so that the two uncovered sides of deposit layer 1 are on top of one another. If the folding is executed on a web which is still wet with solvent, then the use of another adhesive, which would hold the doubled web together, is not necessary; if, however, the web is already dried or the sintering process was used for holding the wash active substance, then naturally, the doubled state of the web must be maintained by using a special adhesive, for example, an acrylic resin adhesive.

The production of some cleaning towels, which are constructed according to the discovery, is explained in the following by means of some examples and is done on a laboratory scale:

Example 1

First, a solution of 20 g synthetic wax in 150 g distilled trichlorethylene is prepared. 40 g alkyl benzene sulfonate are added to this solution with stirring. It is cooled off to normal temperature with further stirring, so that finally a white, brushable paste forms.

A commercial staple fleece fiber of 22 g/m^2 surface weight is impacted with the paste by means of a two roller pad. The dry application amounted to 22 g/m^2 . The product produced is now covered on both sides with two equal webs of fleece which are not supplied with wash active substance. This entire multi-layer web was soaked in a pad with an about 12% dispersion of a hydrophilic polyacrylic acid ester, squeezed out and dried.

The three layer product obtained had a surface weight of 105 g/m^2 .

Example 2

This was made as in Example 1; however, it was made with the difference that the dry application of wash active substance

and wax amounted to only 17 g/m². The total weight of the laminate thus produced amounted to 76 g/m².

Example 3

This was executed with a polyurethane self sponge material web of 2 mm thickness and the sponge material was soaked in a wax-alkyl benzene sulfonate paste in a two roller pad and then dried. After drying, the sponge material web had a surface weight of 43 g/m².

The soft sponge material thus pretreated was then lined as in Example 1 with two webs of fleece. The finished laminate had a surface weight of 78 g/m².

Example 4

A laminate was made as described in Example 2, but with omitting the wax from the ingredients conforming to Example 1. The middle position was furnished with only 14 g/m² alkyl benzene sulfonate.

Comparative Test:

In order to test the deposit action of the individual specimens produced according to Examples 1 to 4, specific weighed amounts of the cleaning fleece material made were poured over with 10 cm³ tap water of 140 German hardness (d.H.) in a wide test tube and were agitated for 1 minute at 450 throws/minute.

The weighed amounts were selected so that the same amount of wash active substance, namely 0.07 g, was contained in the samples.

After the agitating treatment was finished, the height of the foam was determined, subsequently suctioned off and again poured over with 10 cm³ water. After that, the throw cycle was repeated and thus continued until the deposit was exhausted and foam formation was no longer observed. The heights of foam observed are a measure of the number of usage cycles which the cleaning towel can perform.

number of washings	foam heights in mm			
	ex. 1	ex. 2	ex.3	ex.4
1	37	58	65	86
2	20	17	35	14
3	18	19	14	7
4	15	16	11	2
5	15	14	11	0
6	12	10	10	0
7	10	9	8	0
8	7	9	7	0
9	4	7	5	0
10	2	5	2	0

Similar tests were made with cleaning towels, which were produced with the other process which was described. In each case it was shown that the cleaning towels made and constructed according to the discovery, in which the wash active substance was fixed with water insoluble organic binders, withstood considerably more cleaning cycles than the comparison sample in which this was not the case. It was observed in this case that the amount of the wash active substance given off to the water was sufficiently complete in order to develop accelerated cleaning power.

PATENT CLAIMS

1. Cleaning towel with detergent deposit, characterized by the fact that the towel has one or several deposit layers (1), in which the wash active substance is fixed by means of water insoluble organic binders, and that at least the flat sides of the deposit layer are covered with porous top layers (3).
2. Cleaning towel conforming to Claim 1, characterized by the fact that the deposit layer (1) consists of fleece or open-celled soft sponge material.
3. Cleaning towel conforming to Claim 1, characterized by the fact that the wash active substance is sintered to the deposit layer by means of powdered thermoplastic plastics.
4. Cleaning towel conforming to Claim 1, characterized by the fact that the top layer (3) consists of fleece and is glued to the deposit layer (1).
5. Process for making cleaning towels with detergent deposit, characterized by the fact that a web of fleece or open-celled soft sponge material is first soaked with the aqueous solution of a wash active substance and is dried, then it is soaked with the solution of an organic water insoluble binder, the web thus produced is covered with at least one top layer, doubled if necessary, again dried and is cut into individual towels.
6. Process for making cleaning towels with detergent deposit, characterized by the fact that a web of fleece or open-celled soft sponge material is first loaded with a pasty mixture of detergent active substance and the solution of a water insoluble organic binder, then covered at least on one side with a porous top layer, doubled if necessary dried and cut into individual towels.
7. Process for making cleaning towels with detergent deposit, characterized by the fact that a web of fleece or open-celled soft sponge material is loaded with a powdered mixture of detergent active substance and a thermoplastic material, the web is briefly heated to sintering temperature of the thermoplastic material and is thereupon lined with a top layer at least on one side, doubled if necessary and cut into individual towels.

Fig.1

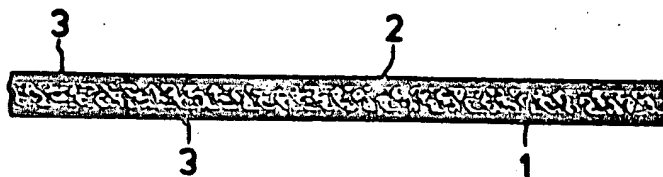
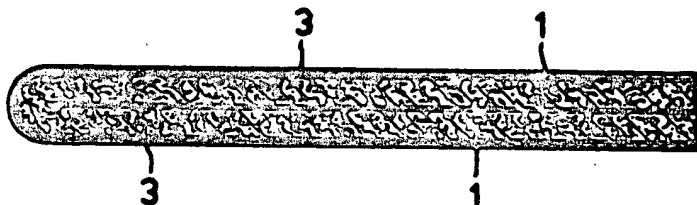


Fig.2



VERE * F08 32978Y/18 DT 2549-065
 Cleaning cloth contg. detergent - fixed to web or foam with organic
 binder and covered with porous top
 VER PAPIERW SCHICKEDANZ 03.11.75-DT-549065
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 Cloth contains one or more deposit layers (1), in which de-
 tergent is fixed with water-insoluble organic binders, e.g.
 wax or thermoplastics. At least the flat sides of the de-
 posit layers are covered with porous top layers.
 Cloths can be used for household cleaning, for cleaning
 wind-screens, offices etc. Cloth can be used repeatedly
 without exhausting deposit.
 In an example, viscose web was (1) treated with 22 g/
 m² of paste contg. 40 g alkylbenzene sulphonate in 20 g
 wax + 150 g C₂HCl₃, (2) lined with fleece. Detergent act-
 ivity (measured as foam level in mm) fell from 37 mm to
 15 mm after 5 cycles and to 2 mm after 10. 3.11.75 as
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